(54) **SCALABLE VOLUMETRIC 3D RECONSTRUCTION**

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(57) **ABSTRACT**

Scalable volumetric reconstruction is described whereby data from a mobile environment capture device is used to form a 3D model of a real-world environment. In various examples, a hierarchical structure is used to store the 3D model where the structure comprises a root level node, a plurality of interior level nodes and a plurality of leaf nodes, each of the nodes having an associated voxel grid representing a portion of the real world environment, the voxel grids being of finer resolution at the leaf nodes than at the root node. In various examples, parallel processing is used to enable captured data to be integrated into the 3D model and/or to enable images to be rendered from the 3D model. In an example, metadata is computed and stored in the hierarchical structure and used to enable space skipping and/or pruning of the hierarchical structure.